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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09:920,628	08/03/2001	Takahito Nakazawa	04329.2619	6946

7590 07/30/2003

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EXAMINER

ZARNEKE, DAVID A

ART UNIT

PAPER NUMBER

2827

DATE MAILED: 07/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/920,628

Applicant(s)

NAKAZAWA ET AL.

Examiner

David A. Zarneke

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/19/03 has been entered.

Response to Arguments

The amendment filed June 19, 2003 has been considered. Within the amendment several arguments were presented and a new limitation was added to the independent claim.

First, applicant traverses the examiner's position that the keeping of the pins at a peak position for an amount of time that allows the chips to be peeled from the tape is an inherent property and requests a reference supporting this position.

Applicant's argument has been fully considered but it is not persuasive.

The examiner asserts, as in the last office action, that Kobayashi teaches this limitation. The examiner's position is that the pins of Kobayashi must be in the raised position for at least an instant before it descends away from the chip (5, 1+).

Further, Applicant argues that Kobayashi fails to teach the pins as not piercing the tape when they are raised.

Applicant's argument has been fully considered but it is not persuasive.

The examiner asserts, as in the last office action, that Kobayashi does indeed teach this limitation. While the specification might not specifically teach this limitation, the figures do teach this limitation (Figure 3). Figures can be used as prior art (MPEP 2125).

Lastly, it is argued that Kobayashi fails to teach the newly added limitation, namely the blowing of an inert gas at a high temperature to the adhesive tape so as to decrease adhesion of the adhesive tape.

The examiner agrees with this argument, but it is moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi, US Patent 5,351,872, in view of Yamanaka, US Patent 5,641,714, and Sumi et al., US Patent 5,110,393.

Kobayashi teaches a die bonding apparatus comprising:

adhering chips (2) diced from a wafer onto the adhesive side of a tape (3);

repeating the steps of peeling the chips of the tape comprising the steps:

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thrusting the chip using pins (31) from the backside of the tape with the tape between the pins and the chip (Figure 3), and keeping the pins at a peak position such that the chips can be peeled off the tape, wherein the pins do not pierce the tape (Figure 3);

descending a collet (12) from the adhesive side of the tape to contact and suck the chip and peel it off the tape; and

picking up the chip by ascending the collet.

Kobayashi fails to teach blowing of an inert gas at a high temperature to the adhesive tape so as to decrease adhesion of the adhesive tape.

Yamanaka teaches a method of separating dice from a wafer comprising:

affixing a tape to a wafer;

dicing the wafer into individual die; and

blowing hot air so as to thermally shrink and peel the tape from the individual die (7, 26+).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the blown hot air of Yamanaka in the invention of Kobayashi because Yamanaka teaches that the blown hot air lowers the adhesive strength of the adhesive layer and causes self-peeling (7, 36+), which makes it considerably easier to remove the die from the tape than relying on the pins and the vacuum to forcibly break the adhesive bond.

Yamanaka fails to teach the blowing of an inert gas.

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Sumi teaches stripping protective sheet and from a PCB using a pressurized gas which can be either air or an inert gas (4, 36+).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the inert gas of Sumi in place of the air of Yamanaka because Sumi teaches the equivalence of an inert gas to air in the peeling of a cover or protective layer from a base substrate.

The substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution. Ex parte Novak 16 USPQ 2d 2041 (BPAI 1989); In re Mostovych 144 USPQ 38 (CCPA 1964); In re Leshin 125 USPQ 416 (CCPA 1960); Graver Tank & Manufacturing Co. V. Linde Air Products Co. 85 USPQ 328 (USSC 1950).

Regarding claim 14, Kobayashi teaches the use of a position camera (29).

Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi, US Patent 5,351,872, in view of Yamanaka, US Patent 5,641,714, and Sumi et al., US Patent 5,110,393, as applied to claim 13 above, and further in view of Satoh, US Patent 6,338,980, or Ohuchi, 6,107,164, or Riding et al., US Patent 6,083,811.

Regarding claim 15, Kobayashi, Yamanaka and Sumi, relied upon as taught above, all fail to teach forming a half cut groove into the active face of the wafer without fully penetrating through the wafer along a dicing line or a chip separation line, and then grinding the back side of the wafer to separate chips.

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Satoh, Ohuchi and Riding all teach the forming of grooves into the active surface of a wafer and then grinding the back side of the wafer to form separate chips (Abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the inventions of Satoh, Ohuchi and Riding in the combined inventions of Kobayashi, Yamanaka and Sumi because Satoh teaches that this method is cheaper and more productive while preventing the occurrence of fractures in the chips (3, 17+); Ohuchi teaches that warpage is reduced (4, 20+); and Riding teaches that chip outs, cracking and ragged chip edges are reduced (1, 26+).

With respect to claim 16, it would have been obvious to one of ordinary skill in the art at the time of the invention to optimize the speed the pins move so as to control damage done to the chip (QPEP 2144.05(b)).

One of ordinary skill in the art at the time of the invention would know that it is important to treat the chips, especially with thin chips, carefully so as to prevent damage being done to the chip. With this in mind, the speed that the pins moved at would be an important consideration of one of ordinary skill in the art so as to limit any damage done to the chips when the pins contact and move the chips.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sumi et al., US Patent 5,312,505, Sumi, US Patent 5,000,814, Rando, US Patent 4,915,757, Hamamura et al., US Patent 4,867,836, Seki, US Patent 4,770,737,

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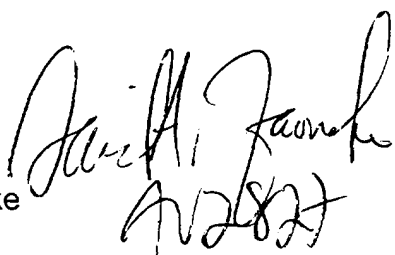
Candore, US Patent 5,358,591, Miller, US Patent 6,244,323, and Wright et al., US Patent 5,600,298 are all cited as teaching the blowing of air or an inert gas to peel one layer from another.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David A. Zarneke whose telephone number is (703)-305-3926. The examiner can normally be reached on M-F 10AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on (703)-305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are (703)-308-7722 for regular communications and (703)-308-7721 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-308-0956.

David A. Zarneke
July 26, 2003

A handwritten signature in black ink, appearing to read "David A. Zarneke", with a date "7/26/03" written below it.